

Amendments to the Specification

Please amend the paragraph beginning on page 3, line 9, as follows:

An OFDM format for a signal in first and second configurations is shown in Figures 1A and 1B. In the format of Figure 1A, a DFT (or FFT) block 11A is preceded by a cyclic prefix segment 13A that serves as a guard interval for the DFT block. Use of a guard interval, or its equivalent, is required with an OFDM format, in order to account for the possible presence of multipath signals in a received signal. In the format of Figure 1B, a DFT block is followed by a zero-padding segment that also serves as a guard interval for the DFT block.

Please amend the paragraph beginning on page 3, line 16, as follows:

A pseudo-random or pseudo-noise (PN) sequence, a coded m-sequence of symbols, is ~~used in uscd in~~ an OFDM format. An m-sequence is a sequence of symbols, usually 0's and 1's, of a selected length that satisfies three requirements: (1) the number of symbols of different types (e.g., the number of 0's and the number of 1's) is "balanced", or approximately the same, over the set of such sequences; (2) the Boolean sum of any two m-sequences, and the result of end-around shifting of symbols in any m-sequence, is again an m-sequence; and (3) the convolution of two m-sequences, $MS(t;i)$ and $MS(t;j)$, satisfies an orthogonality condition:

$$MS(t+\Delta t;i) * MS(t;j) = \delta(\Delta t) \delta(i;j) \quad (1)$$

where $\delta(\Delta t)$ is a modified delta function ($\delta(-\Delta t) \delta(\Delta t) = 0$ for $|\Delta t| > \Delta t_1$) and $\delta(i;j)$ is a Kronecker delta ($= 0$ unless $i = j$). The Kronecker delta can be omitted if the m-sequence is independent of the index number i , or if the index numbers are known to satisfy $i = j$. The length of an m-sequence is most conveniently chosen to be $2^J - 1$, where J is a selected positive integer, such as $J = 7, 8$ or 9 .

Please amend the paragraph beginning on page 7, line 5, as follows:

Let $h(t)$ be a response to transmission of an impulse signal $\delta(t)$ (modified delta function with infinitesimal width Δt_1) along the transmission channel TC used for a signal frame. If the signal $Tr(t)$ is transmitted along the channel TC , a received signal $Rc(t)$ may be expressed as a convolution of the transmitted signal and the impulse response signal,

$$Rc(t2) = Tr(t1) * h(t2 - t1), \quad (3)$$

$$Tr(t) = PN(t;i;ideal) + mp(t) \quad (t=(i;Rc) \leq t < t'(i+1;Rc)), \quad (4)$$

where * indicates that a convolution or correlation operation is performed on the two signals $Tr(t_1)$ and $h(t_2 - t_1)$. Because of the orthogonal construction of each PN sequence in Eq. (1), one verifies that

$$PN(t + \Delta t; i; ideal) * PN(t; j; ideal) = \delta(\Delta t) \delta(i, j) \quad (5)$$

$$\begin{aligned} PN(t + \Delta t; i; ideal) * Rc(t) \\ = \delta(\Delta t) * h(t) + (\text{small residual due to } mp(t)) \end{aligned} \quad (6)$$

within a time interval $t'(i;Rc) \leq t \leq t''(i;Rc)$, where the Kronecker delta index $\delta(i, j)$ (= 0 or 1) can be dropped if the PN sequences $PN(t; i; ideal)$ are independent of the index i , or if the particular PN sequence (i) is known and $i = j$.

Please amend the paragraph beginning on page 9, line 9, as follows:

One method of estimating one or more transmission channel characteristics analyzes the Fourier transform $FT(f;Rc)$ of a received signal $Rc(t)$ corresponding to transmission of an impulse function $h(t)$. Ideally, the Fourier transform $FT(f;Rc)$ is approximately a sync function,

$$FT(f;Rc;ideal) = sync(f/f_0), \quad (10)$$

with an appropriate choice of a reference frequency f_0 representing the bandwidth in the Fourier domain. The deviation of the actual Fourier transform $FT(f;Rc)$ from the ideal transform $FT(f;Rc;ideal)$ can be used to estimate one or more (time varying) characteristics for the transmission channel, frame by frame or over a sequence of frames, as desired.

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